Übung 6

Thursday, 28 April 2022 15:07

Aufgabe 4

$$\begin{pmatrix} 1 & 1 \\ 2 & 1 \end{pmatrix} x = \begin{pmatrix} 0 \\ 1 \end{pmatrix} \quad \Big| \quad x_0 \begin{pmatrix} 0 \\ -1 \end{pmatrix} \quad \tilde{x}_0 \begin{pmatrix} 0 \\ 1 \end{pmatrix}$$

$$x_i^{(k+1)} = \frac{1}{a_{ii}} \left(b_i - \sum_{j<i} a_{ij} x_j^{(k+1)} - \sum_{j>i} a_{ij} x_j^{(k)} \right)$$

$x_0 = (0, -1)^T$ $\quad \begin{pmatrix} 1 & 1 \\ 2 & 1 \end{pmatrix} \begin{pmatrix} 0 \\ 1 \end{pmatrix}$ $\quad \tilde{x}_0 = (0, 1)^T$

$x_1^{(1)} = \frac{1}{1} \left(0 - (0) - (-1 \cdot 1) \right) = 1$

$x_2^{(1)} = \frac{1}{1} \left(1 - (2 \cdot 1) - (0) \right) = -1$

$x_1^{(2)} = 1 \left(0 - (0) - (1 \cdot (-1)) \right) = 1$

$x_2^{(2)} = 1 \left(1 - (2 \cdot 1) - (0) \right) = -1$

Redundant

$\tilde{x}_1^{(1)} = \frac{1}{1} \left(0 - (0) - (1 \cdot 1) \right) = -1$

$\tilde{x}_2^{(1)} = \frac{1}{1} \left(1 - (2 \cdot -1) - (0) \right) = 3$

$\tilde{x}_1^{(2)} = \frac{1}{1} \left(0 - (0) - (1 \cdot 3) \right) = -3$

$\tilde{x}_2^{(2)} = \frac{1}{1} \left(1 - (2 \cdot -3) - (0) \right) = 7$

$\tilde{x}_1^{(3)} = \frac{1}{1} \left(0 - (0) - (1 \cdot 7) \right) = -7$

$\tilde{x}_2^{(3)} = \frac{1}{1} \left(1 - (2 \cdot -7) - (0) \right) = 15$

$\tilde{x}_1^{(4)} = \frac{1}{1} \left(0 - (0) - (1 \cdot 15) \right) = -15$

$\tilde{x}_2^{(4)} = \frac{1}{1} \left(1 - (2 \cdot -15) - (0) \right) = 31$